

CLAIMS

- Sub B1
1. An ethylene (co)polymer (A1) being either an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 4 to 20 carbon atoms wherein

(i_{A1}) the ethylene (co)polymer contains methyl branches less than 0.1 in number per 1,000 carbon atoms measured by ¹³C-NMR, and

- 10 (ii_{A1}) the ethylene (co)polymer has Mw/Mn (Mw denotes the weight average molecular weight; Mn denotes the number average molecular weight) measured by gel permeation chromatography not lower than 1.8 and lower than 4.5.

- 15 2. The ethylene (co)polymer (A1) according to claim 1, wherein

(iii_{A1}) the intrinsic viscosity measured at 135°C in decalin is within a range of 0.2 to 18 dl/g.

- 20 3. The ethylene (co)polymer (A1) according to claim 1 or 2, wherein

Sub B2

(iv_{A1}) the intrinsic viscosity ($[\eta]$ (dl/g)) and the density (d (g/cm³)) satisfy the following relation;

$d \geq 0.0003 \times [\eta]^2 - 0.0121 \times [\eta] + 0.9874$; in the case the intrinsic viscosity-measured at 135°C in decalin is 0.3 to 1.5 dl/g.

- 5 4. The ethylene (co)polymer (A1) according to any one of the claims 1 to 3, wherein

(v_{A1}) the intrinsic viscosity ([η] (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy
10 the following relations;

$$[\eta] > 1.85 \times \text{MFR}^{-0.192} \text{ in the case of } \text{MFR} < 1 \text{ and}$$

$$[\eta] > 1.85 \times \text{MFR}^{-0.213} \text{ in the case of } \text{MFR} \geq 1.$$

- 15 5. The ethylene (co)polymer (A1) according to any one of the claims 1 to 4, wherein

(vi_{A1}) the components eluted at 105°C or higher in a heating elution separation test are not more than 5% by weight or lower in the case the comonomer content is 1.5 mole% or higher and the components eluted at 106°C or
20 higher in a heating elution separation test are not more than 8% by weight or lower in the case the comonomer content is less than 1.5 mole%.

6. The ethylene (co)polymer (A1) according to any one of the claims 1 to 5, wherein

5 (vii_{A1}) the components are precipitated in 15% by weight or lower in the case said ethylene (co)polymer is dissolved in p-xylene at 130°C and then cooled to 75°C to precipitate dissolved components in a poor solvent.

7. The ethylene (co)polymer (A1) according to any one of the claims 1 to 6, wherein

10 (viii_{A1}) the decane-soluble components (W (% by weight)) at 23°C and the density (d (g/cm³)) satisfy the following relations;

$$W < 80 \times \exp(-100 \times (d - 0.88)) + 0.1$$
 in the case MFR \leq 10 g/10 minutes and

15
$$W < 80 \times (\text{MFR} - 9)^{0.26} \times \exp(-100 \times (d - 0.88)) + 0.1$$
 in the case MFR $>$ 10 g/10 minutes.

8. The ethylene (co)polymer (A1) according to any one of the claims 1 to 7, wherein

20 (ix_{A1}) the α -olefin content (K (mole%)) and the melting point (T_m (°C)) of the highest peak of an endothermic curve measured by a differential scanning calorimeter satisfy the following relations;

$T_m \leq 135.0 - 10.0K$ in the case $K = 0.1$ to 1.5 mole%;

$T_m \leq 121.9 - 1.3K$ in the case $K = 1.5$ to 5.5 mole%;

and

$T_m \leq 139.7 - 4.5K$ in the case $K = 5.5$ to 20 mole%.

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9. The ethylene (co)polymer (A1) according to any one of the claims 1 to 8, wherein

(x_{A1}) the number of branches having a length equivalent to that of hexyl or longer measured by ^{13}C -NMR

10 is less than 0.1 per 1,000 of carbon atoms.

10. The ethylene (co)polymer (A1) according to any one of the claims 1 to 9, wherein the ethylene (co)polymer is a copolymer of ethylene and 1-butene.

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11. The ethylene (co)polymer (A1) according to any one of the claims 1 to 9, wherein the ethylene (co)polymer is a copolymer of ethylene and 1-hexene.

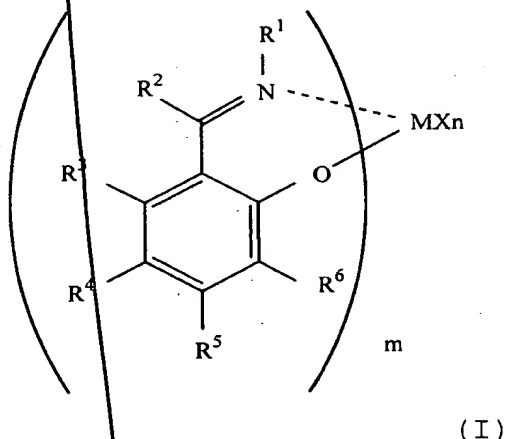
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12. The ethylene (co)polymer (A1) according to any one of the claims 1 to 11, produced by either homopolymerization of ethylene or copolymerization of

ethylene and an α -olefin of 4 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising

(a1) a transition metal compound of the following general formula (I)

5



(where, M denotes a transition metal atom selected from the group IV and the group V of the periodic table;

10

m denotes 1 or 2;

R^1 denotes an aliphatic hydrocarbon group of 5 or more carbon atoms in total which may have aromatic hydrocarbon group or alicyclic hydrocarbon group

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substituents or alicyclic hydrocarbon group of 7 or more carbon atoms in total which may have aromatic hydrocarbon group or aliphatic hydrocarbon group substituents;

Sub B2
5 R^2 to R^5 may be the same or different to one another and each denotes hydrogen atom, a hydrocarbon group, hydrocarbon group-substituted silyl, an oxygen-containing group, a nitrogen-containing group, or a sulfur-containing group and two or more of them may be bonded to one another to form a ring;

R^6 denotes a hydrocarbon group or a hydrocarbon-substituted silyl group;

10 in the case m is 2, at least one of the groups denoted as R^2 to R^6 belonging to any one of the ligands may be bonded to at least one of the groups denoted as R^2 to R^6 belonging to another ligand;

15 in the case m is 2, respective R^1 , respective R^2 , respective R^3 , respective R^4 , respective R^5 , and respective R^6 may be the same or different to one another;

n denotes a number satisfying the valence of M ;

20 X denotes hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a nitrogen-containing group, a boron-containing group, an aluminum-containing group, a phosphorus-containing group, a halogen-containing group, a heterocyclic compound residue group, a silicon-

Sub B2
containing group, a germanium-containing group, or a tin-containing group; in the case n is 2 or higher, X's may be the same or different to one another and X's may be bonded to one another to form a ring

5 and, if necessary,

(b) at least one compound selected from

(b-1) an organometallic compound,

(b-2) an organoaluminum oxy compound, and

10 (b-3) a compound capable of forming ion pairs by reaction on the transition metal compound.

13. An ethylene (co)polymer (A2) being either an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 4 to 20 carbon atoms, wherein

15 (i_{A2}) the ethylene (co)polymer contains methyl branches less than 0.1 in number per 1,000 carbon atoms measured by ¹³C-NMR, and

(ii_{A2}) the ethylene (co)polymer has Mw/Mn (Mw denotes the weight average molecular weight; Mn denotes the
20 number average molecular weight) measured by gel permeation chromatography not lower than 4.5 and not higher than 60.

14. The ethylene (co)polymer (A2) according to claim 13, wherein

(iii_{A2}) the intrinsic viscosity measured at 135°C in decalin is within a range of 0.2 to 18 dl/g.

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15. The ethylene (co)polymer (A2) according to claims 13 or 14, wherein

(iv_{A2}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured in at 135°C decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy the following relations;

$[\eta] > 1.85 \times \text{MFR}^{-0.192}$ in the case of $\text{MFR} < 1$ and

$[\eta] > 1.85 \times \text{MFR}^{-0.213}$ in the case of $\text{MFR} \geq 1$.

15 16. The ethylene (co)polymer (A2) according to any one of the claims 13 to 15, wherein

(v_{A2}) the components having a molecular weight of 500,000 reduced to polyethylene measured by GPC-IR are not more than 5% by weight in the components eluted at 20 105°C or higher in a heating elution separation test.

17. The ethylene (co)polymer (A2) according to any one of the claims 13 to 16, wherein

(vi_{A2}) the components eluted at 105°C or higher in a heating elution separation test are not more than 5% by weight in the case the comonomer content is 1.5 mole% or higher and the components eluted at 106°C or higher in a
5 heating elution separation test are not more than 8% by weight in the case the comonomer content is less than 1.5 mole%.

18. The ethylene (co)polymer (A2) according to any one
10 of the claims 13 to 17, wherein

(vii_{A2}) the components having a molecular weight of 10,000 or more reduced to polyethylene measured by GPC-IR among components obtained by dissolution of the ethylene (co)polymer in p-xylene at 130°C and successive
15 precipitation of the dissolved components by cooling to 75°C in a poor solvent are not more than 30% by weight in the precipitated components.

19. The ethylene (co)polymer (A2) according to any one
20 of the claims 13 to 18, wherein

(viii_{A2}) the components obtained by dissolution of the ethylene (co)polymer in p-xylene at 130°C and successive precipitation of the dissolved components by

cooling to 75°C in a poor solvent are not more than 15% in whole ethylene (co)polymer.

20. The ethylene (co)polymer (A2) according to any one
5 of the claims 13 to 19, wherein

(ix_{A2}) the components having a molecular weight of 10,000 or more reduced to polyethylene measured by GPC-IR among components precipitated by dissolution of the ethylene (co)polymer in p-xylene at 130°C and successive
10 precipitation of the dissolved components by cooling to 75°C in a poor solvent are not more than 5% in whole ethylene (co)polymer.

21. The ethylene (co)polymer (A2) according to any one
15 of the claims 13 to 20, wherein

(x_{A2}) the decane-soluble components (W (% by weight)) at 23°C and the density (d (g/cm³)) satisfy the following relations;

- W < 80 × exp(-100 × (d - 0.88)) + 0.1 in the case
20 MFR ≤ 10 g/10 minutes and

W < 80 × (MFR - 9)^{0.26} × exp(-100 × (d - 0.88)) + 0.1
in the case MFR > 10 g/10 minutes.

22. The ethylene (co)polymer (A2) according to any one of the claims 13 to 21, wherein

(xi_{A2}) the number of branches having a length equivalent to that of hexyl or longer measured by ¹³C-NMR is less than 0.1 per 1,000 of carbon atoms.

23. The ethylene (co)polymer (A2) according to any one of the claims 13 to 22, wherein

(xii_{A2}) the ratio Mw/Mn of the weight average molecular weight (Mw) and the number average molecular weight (Mn) calculated from the logarithmic normal distribution produced by distributing molecular weight distribution curves measure by gel permeation chromatography to two same logarithmic normal distribution curves is within a range of 3 to 8.

24. The ethylene (co)polymer (A2) according to any one of the claims 13 to 23, wherein

(xiii_{A2}) components to be eluted at 109°C or higher in a heating elution separation test exist and the intrinsic viscosity ($[\eta]$ (dl/g)) thereof measured at 135°C in decalin and the density (d (g/cm³)) of said components satisfy the following relation;

$$d \geq 0.0003 \times [\eta]^2 - 0.0121 \times [\eta] + 0.9874.$$

25. The ethylene (co)polymer (A2) according to any one of the claims 13 to 24 wherein the ethylene (co)polymer is a copolymer of ethylene and 1-butene.

26. The ethylene (co)polymer (A2) according to any one of the claims 13 to 24 wherein the ethylene (co)polymer is a copolymer of ethylene and 1-hexene.

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27. The ethylene (co)polymer (A2) according to any one of the claims 13 to 26, comprising

(A2-1) either ethylene homopolymer or a copolymer of ethylene and an α -olefin of 4 to 20 carbon atoms, having

15 (i_{A2-1}) the intrinsic viscosity ($[\eta]_{A2-1}$) measured at 135°C in decalin is within a range of 0.3 to 2.5 dl/g,

(ii_{A2-1}) the number of methyl branches measured by ¹³C-NMR is less than 0.1 per 1,000 of carbon atoms, and

(iii_{A2-1}) Mw/Mn (Mw denotes the weight average molecular weight; Mn denotes the number average molecular weight) measured by gel permeation chromatography within a range of 3 to 8, and

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(A2-2) either ethylene homopolymer or a copolymer of ethylene and an α -olefin of 4 to 20 carbon atoms, having

(i_{A2-2}) the intrinsic viscosity ($[\eta]_{A2-2}$) measured at 135°C in decalin within a range of 2.0 to 20 dl/g, and

5 (ii_{A2-2}) the number of methyl branches measured by ¹³C-NMR less than 0.1 per 1,000 of carbon atoms;

wherein a relation between the intrinsic viscosity ($[\eta]_{A2-1}$) of said ethylene (co)polymer (A2-1) and the intrinsic viscosity ($[\eta]_{A2-2}$) of said ethylene

10 (co)polymer (A2-2) satisfy $[\eta]_{A2-1} < [\eta]_{A2-2}$; and the ethylene (co)polymer contains 10 to 90 parts by weight of said ethylene (co)polymer (A2-1) and 10 to 90 parts by weight of said ethylene (co)polymer (A2-2), where (A2-1) + (A2-2) = 100 parts by weight.

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28. The ethylene (co)polymer (A2) according to claim 27, wherein said ethylene (co)polymer (A2-1) satisfies the following relation between the intrinsic viscosity ($[\eta]$ (dl/g)) and the density (d (g/cm³));

20 $d \geq 0.0003 \times [\eta]^2 - 0.0121 \times [\eta] + 0.9874$; in the case the intrinsic viscosity measured at 135°C in decalin is 0.3 to 1.5 dl/g.

~~29.~~ An ethylene (co)polymer (A3) being either an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 3 to 20 carbon atoms, wherein

(i_{A3}) the melt tension (MT (g)) at 190°C and the
5 swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the relation;

$$\log(MT) > 12.9 - 7.15 \times SR; \text{ and}$$

(ii_{A3}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10
10 minutes)) measured under 2.16 kg load at 190°C satisfy the relations;

$$[\eta] > 1.85 \times MFR^{-0.192} \text{ in the case of } MFR < 1 \text{ and}$$

$$[\eta] > 1.85 \times MFR^{-0.213} \text{ in the case of } MFR \geq 1.$$

15 30. The ethylene (co)polymer (A3) according to claim 29, wherein

(iii_{A3}) the weight average molecular weight (Mw) measured by gel permeation chromatography and the swell ratio (SR) calculated from the strand diameter extruded
20 at 190°C satisfy the relation;

$$SR > 4.55 - 0.56 \times \log(Mw).$$

31. The ethylene (co)polymer (A3) according to claims 29 or 30, wherein

(iv_{A3}) the number average molecular weight (Mn), the weight average molecular weight (Mw), and the Z average molecular weight (Mz) measured by gel permeation chromatography satisfy the relations;

$$Mz/Mw \geq 7/(1 - 5.5/(Mw/Mn)), \text{ and}$$

$$Mw/Mn > 5.5.$$

10 32. The ethylene (co)polymer (A3) according to any one of the claims 29 to 31, wherein

(v_{A3}) the number of the vinyl groups at the molecular terminals calculated by conversion to that per one molecular chain having the same molecular weight as the number average molecular weight is not lower than 0.50.

33. The ethylene (co)polymer (A3) according to any one of the claims 29 to 32, wherein the ethylene (co)polymer is an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 4 to 20 carbon atoms and has methyl branches measured by ¹³C-NMR less than 0.1 in number per 1,000 of carbon atoms.

34. An ethylene (co)polymer (A4) being an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 3 to 20 carbon atoms, wherein

(i_{A4}) the number average molecular weight (Mn), the weight average molecular weight (Mw), and the Z average molecular weight (Mz) measured by gel permeation chromatography satisfy the relation;

$$Mz/Mw \geq 4 / (0.5 - 4.50 / (Mw/Mn) - 0.2), \text{ and}$$

$$Mw/Mn > 9.2.$$

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35. The ethylene (co)polymer (A4) according to claim 34, wherein

(iii_{A4}) the melt tension (MT (g)) at 190°C and the swell ratio (SR) calculated from the strand diameter

15 extruded at 190°C satisfy the relation;

$$\log(MT) > 12.9 - 7.15 \times SR; \text{ and}$$

(iv_{A4}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy

20 the relations;

$$[\eta] > 1.85 \times MFR^{-0.192} \text{ in the case of } MFR < 1, \text{ and}$$

$$[\eta] > 1.85 \times MFR^{-0.213} \text{ in the case of } MFR \geq 1.$$

36. The ethylene (co)polymer (A4) according to claim 34, wherein

(ii_{A4}) the weight average molecular weight (Mw) measured by gel permeation chromatography and the swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the relation;

$$SR > 4.55 - 0.56 \times \log(Mw);$$

(iii_{A4}) the melt tension (MT (g)) at 190°C and the swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the relation;

$$\log(MT) > 12.9 - 7.15 \times SR; \text{ and}$$

(iv_{A4}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy the relations;

$$[\eta] > 1.85 \times MFR^{-0.192} \text{ in the case of } MFR < 1, \text{ and}$$

$$[\eta] > 1.85 \times MFR^{-0.213} \text{ in the case of } MFR \geq 1.$$

37. The ethylene (co)polymer (A4) according to any one of the claims 33 to 36, wherein

(v_{A4}) the number of the vinyl groups at the molecular terminals calculated by conversion to that per one

molecular chain having the same molecular weight as the number average molecular weight is not lower than 0.50.

38. The ethylene (co)polymer (A4) according to any one
5 of the claims 34 to 37, wherein the ethylene (co)polymer is either an ethylene homopolymer or a (co)polymer of ethylene and an α -olefin of 4 to 20 carbon atoms and has methyl branches measured by ^{13}C -NMR less than 0.1 in number per 1,000 of carbon atoms.

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~~39.~~ An ethylene (co)polymer (A5) being either an ethylene homopolymer or a copolymer of ethylene and an α -olefin of 3 to 20 carbon atoms, wherein

(i_{A5}) there are at least 2 maximum values and at
15 least 1 minimum value in the molecular weight distribution curve measured by gel permeation chromatography and the intensity (W_1) of the minimum value and the lower intensity (W_2) of the maximum values having the minimum value between them satisfy;

20 $W_1 / W_2 < 0.85$.

40. The ethylene (co)polymer (A5) according to claim 39, wherein

(iii_{A5}) the melt tension (MT (g)) at 190°C and the swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the relation;

$$\log(MT) > 12.9 - 7.15 \times SR; \text{ and}$$

- 5 (vi_{A5}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy the relations;

$$[\eta] > 1.85 \times MFR^{-0.192} \text{ in the case of } MFR < 1, \text{ and}$$

- 10 $[\eta] > 1.85 \times MFR^{-0.213}$ in the case of $MFR \geq 1$.

41. The ethylene (co)polymer (A5) according to claim 39, wherein

- (ii_{A5}) the weight average molecular weight (Mw)
15 measured by gel permeation chromatography and the swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the relation;

$$SR > 4.55 - 0.56 \times \log(Mw);$$

- (iii_{A5}) the melt tension (MT (g)) at 190°C and the
20 swell ratio (SR) calculated from the strand diameter extruded at 190°C satisfy the following relation;

$$\log(MT) > 12.9 - 7.15 \times SR; \text{ and}$$

(η_{A5}) the intrinsic viscosity ($[\eta]$ (dl/g)) measured at 135°C in decalin and the melt flow rate (MFR (g/10 minutes)) measured under 2.16 kg load at 190°C satisfy the relations;

- 5 $[\eta] > 1.85 \times \text{MFR}^{-0.192}$ in the case of $\text{MFR} < 1$, and
 $[\eta] > 1.85 \times \text{MFR}^{-0.213}$ in the case of $\text{MFR} \geq 1$.

42. The ethylene (co)polymer (A5) according to any one of the claims 39 to 41, wherein

- 10 (v_{A5}) the number of the vinyl groups at the molecular terminals calculated by conversion to that per one molecular chain having the same molecular weight as the number average molecular weight is not lower than 0.50.

- 15 43. The ethylene (co)polymer (A5) according to any one of the claims 39 to 42, wherein the ethylene (co)polymer is either an ethylene homopolymer or a (co)polymer of ethylene and an α -olefin of 4 to 20 carbon atoms and contains methyl branches measured by ^{13}C -NMR less than
20 0.1 in number per 1,000 of carbon atoms.

44. The ethylene (co)polymer composition (C1-1) comprising an ethylene (co)polymer (A1) according to any

one of the claims 1 to 12 and another un-modified polymer (B1).

45. The ethylene (co)polymer composition (C1-1)

- 5 according to claim 44, wherein said another polymer (B1) is an ethylene (co)polymer (B1-1) other than an ethylene (co)polymer (A1) according to any one of the claims 1 to 12.

- 10 46. The ethylene (co)polymer composition (C2-1) comprising an ethylene (co)polymer (A2) according to any one of the claims 13 to 28 and another un-modified polymer (B2).

- 15 47. The ethylene (co)polymer composition (C2-1) according to claim 46, wherein said another polymer (B2) is an ethylene (co)polymer (B2-1) other than an ethylene (co)polymer (A2) according to any one of the claims 13 to 28.

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48. The ethylene (co)polymer composition (C3-1) comprising an ethylene (co)polymer (A3) according to any

one of the claims 29 to 33 and another un-modified polymer (B3).

49. The ethylene (co)polymer composition (C3-1).

- 5 according to claim 48, wherein said another polymer (B3) is an ethylene (co)polymer (B3-1) other than an ethylene (co)polymer (A3) according to any one of the claims 29 to 33.

- 10 50. The ethylene (co)polymer composition (C4-1) comprising an ethylene (co)polymer (A4) according to any one of the claims 34 to 38 and another un-modified polymer (B4).

- 15 51. The ethylene (co)polymer composition (C4-1) according to claim 50, wherein said another polymer (B4) is an ethylene (co)polymer (B4-1) other than an ethylene (co)polymer (A4) according to any one of the claims 34 to 38.

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52. The ethylene (co)polymer composition (C5-1) comprising an ethylene (co)polymer (A5) according to any

one of the claims 39 to 43 and another un-modified polymer (B5).

53. The ethylene (co)polymer composition (C5-1)

- 5 according to claim 52, wherein said another polymer (B5) is an ethylene (co)polymer (B5-1) other than an ethylene (co)polymer (A5) according to any one of the claims 39 to 43.

- 10 54. The molded product made of an ethylene (co)polymer according to any one of the claims 1 to 43.

55. The molded product made of an ethylene (co)polymer composition according to any one of the claims 44 to 53.

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56. The molded product according to claims 54 and 55, wherein the product is either one of a blow molded product, an inflation molded product, a cast molded product, an extrusion lamination molded product, an
20 extrusion molded product, a foam molded product, and an injection molded product.

57. The molded product according to claim 56, wherein the product is a pipe.

58. The graft-modified ethylene (co)polymer (A1-1)
5 comprising an ethylene (co)polymer (A1) according to any one of the claims 1 to 12, wherein polar group-containing monomer is graft-modified.

59. The graft-modified ethylene (co)polymer (A2-1)
10 comprising an ethylene (co)polymer (A2) according to any one of the claims 13 to 28, wherein polar group-containing monomer is graft-modified.

60. The graft-modified ethylene (co)polymer (A3-1)
15 comprising an ethylene (co)polymer (A3) according to any one of the claims 29 to 33, wherein polar group-containing monomer is graft-modified.

61. The graft-modified ethylene (co)polymer (A4-1)
20 comprising an ethylene (co)polymer (A4) according to any one of the claims 34 to 38, wherein polar group-containing monomer is graft-modified.

62. The graft-modified ethylene (co)polymer (A5-1) comprising an ethylene (co)polymer (A5) according to any one of the claims 39 to 43, wherein polar group-containing monomer is graft-modified.

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63. The graft-modified ethylene (co)polymer composition (C1-2) comprising graft-modified ethylene (co)polymer (A1-1) claimed in claim 58 and another un-modified polymer (D1).

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64. The ethylene (co)polymer composition (C1-2) according to claim 63, wherein said another polymer (D1) is an ethylene (co)polymer (D1-1).

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65. The graft-modified ethylene (co)polymer composition (C2-2) comprising graft-modified ethylene (co)polymer (A2-1) claimed in claim 59 and another un-modified polymer (D2).

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66. The ethylene (co)polymer composition (C2-2) according to claim 65, wherein said another polymer (D2) is an ethylene (co)polymer (D2-1).

67. The graft-modified ethylene (co)polymer composition (C3-2) comprising graft-modified ethylene (co)polymer (A3-1) claimed in claim 60 and another un-modified polymer (D3).

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68. The ethylene (co)polymer composition (C3-2) according to claim 67, wherein said another polymer (D3) is an ethylene (co)polymer (D3-1).

10 69. The graft-modified ethylene (co)polymer composition (C4-2) comprising graft-modified ethylene (co)polymer (A4-1) claimed in claim 61 and another un-modified polymer (D4).

15 70. The ethylene (co)polymer composition (C4-2) according to claim 69, wherein said another polymer (D4) is an ethylene (co)polymer (D4-1).

20 71. The graft-modified ethylene (co)polymer composition (C5-2) comprising graft-modified ethylene (co)polymer (A5-1) claimed in claim 62 and another un-modified polymer (D5).

72. The ethylene (co)polymer composition (C5-2) according to claim 71, wherein said another polymer (D5) is an ethylene (co)polymer (D5-1).

5 73. The ethylene (co)polymer composition (C1-3) comprising an ethylene (co)polymer (A1) according to any one of the claims 1 to 12 and a graft-modified ethylene (co)polymer (E1).

10 74. The ethylene (co)polymer composition (C2-3) comprising an ethylene (co)polymer (A2) according to any one of the claims 13 to 28 and a graft-modified ethylene (co)polymer (E2).

15 75. The ethylene (co)polymer composition (C3-3) comprising an ethylene (co)polymer (A3) according to any one of the claims 29 to 33 and a graft-modified ethylene (co)polymer (E3).

20 76. The ethylene (co)polymer composition (C4-3) comprising an ethylene (co)polymer (A4) according to any one of the claims 34 to 38 and a graft-modified ethylene (co)polymer (E4).

77. The ethylene (co)polymer composition (C5-3) comprising an ethylene (co)polymer (A5) according to any one of the claims 39 to 43 and a graft-modified ethylene
- 5 (co)polymer (E5).

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